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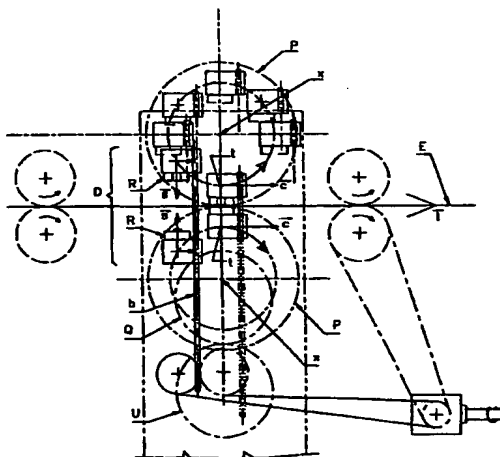
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(54) Title: **PRESS DRIVING MECHANISM**



(57) Abstract: The innovation consists of a device based on a working principle which makes it possible to carry out a wide variety of operations on solid Elements (E) which move in an orderly fashion along various processes of industrial production, without these Elements (E) coming to a halt or undergoing significant disturbances to the continuity of their forward movement along the production line. This is made possible because this device works by following these Elements (E) in a synchronous way, that is moving at the same speed with which they advance along a production line or along a work cycle development, to undergo the present processes. The advantages which derive from this are those due to the low cost of the tools (R) which in this device are simple, flat and not radiated tools (R) because they are destined to work on a flat surface and/or on parallel levels and therefore in the same way as the utensils used on a forming press. Another advantage consists in extending the current limitations due to the WORKING PITCHES relative to the circumferences of the current rotating tools (R), since this device has the ability to operate with infinite WORKING PITCHES.

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which is nearest to both of them and the Element being processed.

5 Since the Operator device carries out this operation on the Element being processed following the "s" movement, it follows that the first part of this operation finishes with the Device at point "t", and hence in perfect kinematic synchronism between the two subjects [TOOLS=("R" Devices) and MATERIAL TO BE PROCESSED=("E" Element)].

10 How long this operation starts before and finishes after reaching point "t" and hence how much the Operator Device (sometimes) disturbs the progress of the Element being processed (because of these Δv), depends on the ability of the Element being processed to absorb these disturbances, on the criticality of the process, on whether or not the Operator Device is able to provide for the correction of these disturbances and lastly on the entity of the disturbance which is a function of the effective linear space during

20 which the tools are used to do the work.

Normally, for the operations of Cutting, Punch-cutting, Printing, low Coining, pre-Shearing, Etc., on Elements being processed of limited thickness, the system absorbs these mistakes in synchronism very well so, in practice, the problem is inexistent.

30 Another characteristic of the invention consists in the fact that the system allows one to obtain high intensities of force on the "R" Device, if another "R" Device or any obstacle is opposed to it, because near the position relative to point "t" a condition which is advantageous to the radial force passing through the "X" centre and the reaction point of the "R" Device is created, when it is near "t".

35 This characteristic can also be usefully exploited for operations on single pieces which are normally carried out on bench vices or on fluid-dynamic or eccentric or screw presses, where the three basic operations (Loading, Processing and Unloading) all take place in the same position, while with this new system it is possible to

40 locate these three operations in different positions and at such a distance between them that the level of the safety for the operator is higher.

rotary-traverse courses and its coming together/pulling away movements (at "s" speed) can be compared to the precise movements of a cutting die mounted on a punch press.

The possible configurations of such a system range from a simple pair (Fig. 2) of machine-members "p" with the "R" parts of the Operator device which process in an overhanging way "narrow" Elements like Threads, Straps, Tubes, Trimming of limited size, Strips, Etc..., to a system (Fig. 3) with two pairs of Devices positioned face-to-face and structured in such a way as to form a sort of double column press for the processing of "wide" products like Plates, Fabrics, Sheets, Boards, Several Elements coupled, Strips, Etc... to system (Fig. 4) with more than one pair of Devices, face-to-face, synchronous and with the "R" parts that form several double column presses linked in such a way as to allow the construction of large platforms for pressing like a multi-column press and in which it is possible to carry out simultaneously a variety of processes.

Moreover, both for overhang operating systems and for double column operating systems, forms of every type are possible, without limits of schematic set up or of combination between them, and they are formed according to what is required by the different applicatory needs.

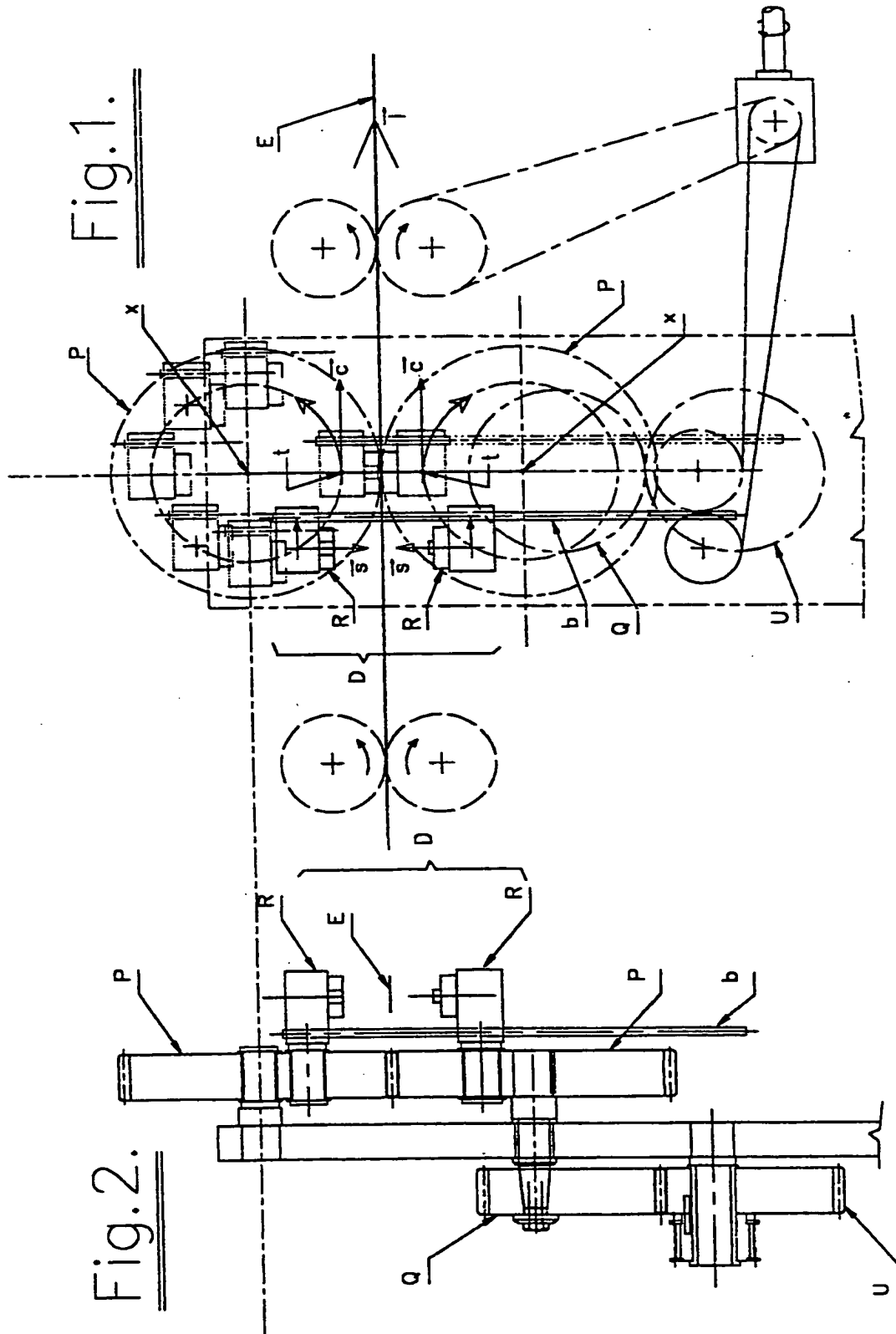
Lastly, it is possible to have polygonal implementations of the Operator device "R" in which each side of the polygon is supplied with a Tool (or Counter-tool) which acts in combination with the respective Counter-tool (or Tool) mounted on one of the "R" devices, of which there are as many as the sides of the polygon and respecting the angular positions around the "X" centre of this polygonal multi-Device.

Various control systems are possible for managing the repetitive processing and permitting synchronism, for whatever pitch of processing, on the various Elements being processed.

These controls can be based on machine-members composed of timing belts, chains, gears, elliptic gears, eccentric gears, etc., but they can also be based on electronic apparatus with closed and/or open link in such a way that each turn around the "X"

CLAIMS.

- 5 1. Universal system for obtaining processes in movement on elements in transit along a generic cycle of industrial manufacturing and/or processing by straight tools;
- 10 2. System of dynamic pressing which is able to carry out simultaneously one or more operations like Shearing, Punch-cutting, Printing, Cutting, Pre-shearing, Pairing, Transferring, Assembling, Dismantling, Feeding, Loading, Withdrawing, Joining, Dragging, Marking, Coining, Stamping, Deforming, Accelerating, Decelerating, Creasing, Handling, Transferring, Applying, Pressing, Inspection, Control, Testing and any
15 Physical Operations in general, on solid Elements which move in an orderly fashion along various processes of industrial production.
- 20 3. Apparatus for mechanical control through the use of positive machine-members for the transmission of motion, like Timing belts, Chains, Gears, Elliptic gears, Etc.;
4. Apparatus for closed link electronic control for control in real time of the speed of synchronism in function of the PITCH of processing;
- 25 5. Apparatus for open link electronic control for control in real time of the synchronism but without feed-back checking and with the possibility of working even at variable Pitch;
- 30 6. Application of the invention in the paper-converting industry in general, in the graphic industry in general and in the manufacturing industry of all those products manufactured in places and production lines organized in processes and/or simple or complex cycles;
- 35 7. Unlimited forms of the Operator device in function of the various applicatory needs and in terms of number, layout and combination;
- 40 8. Unlimited production of the Operator device in terms of typology of materials, structural forms and dimensions;
9. Unlimited applicability in terms of Applicatory Industrial-Economic Sector.



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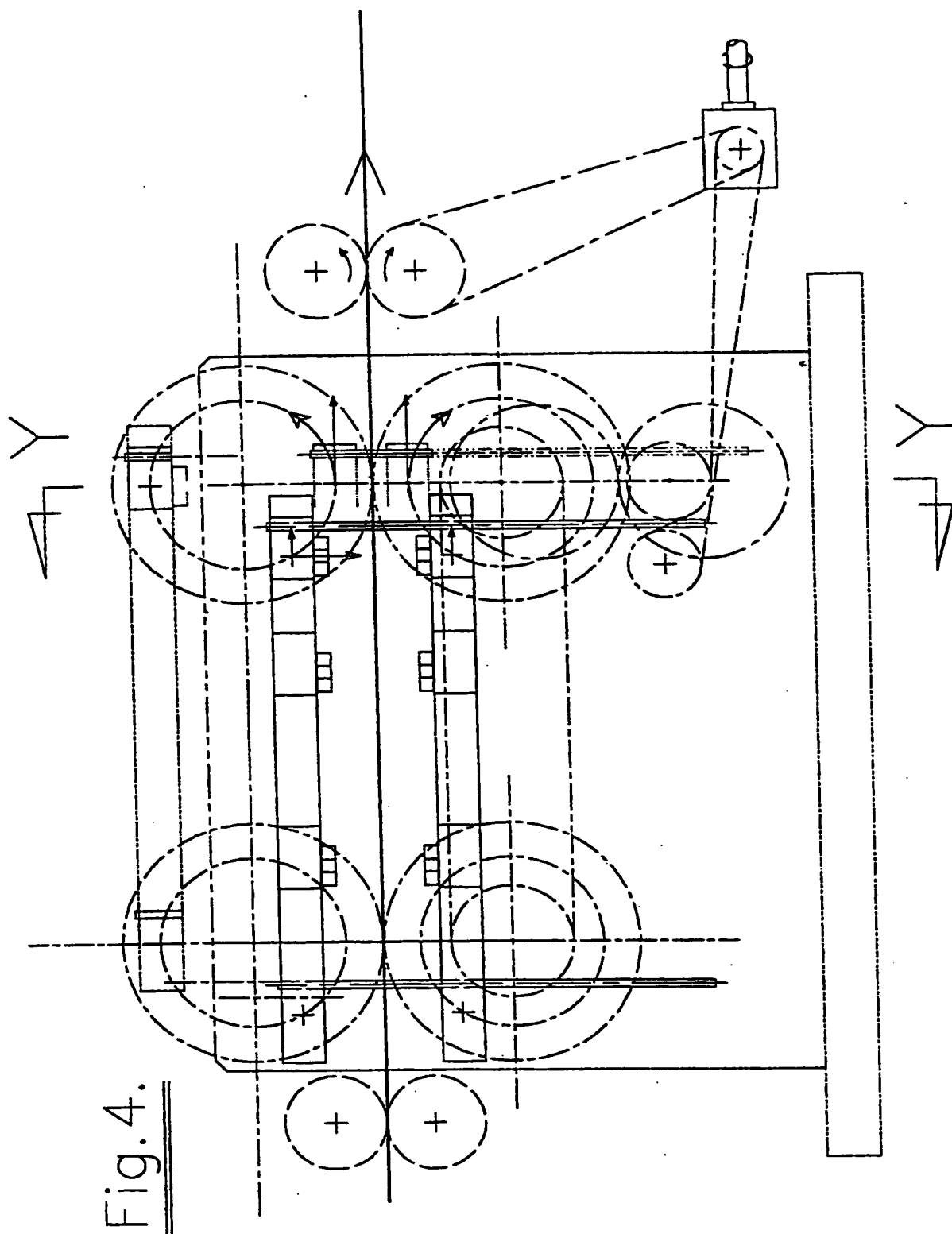


Fig. 4.

INTERNATIONAL SEARCH REPORT

national application No.
PCT/IT 00/00317

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 1-9
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

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